News

Solar Flares Increased in 1982

Geomagnetic storms and solar flares occurred more frequently in 1982 13 years after the solar maximum of the current 11-year sunspot cycle) than is usual for that portion of the cycle. Among the most notable events were two X-12 flares and one X-7 flare. Although less intense, the X-7 flare triggered the most fierce geomagnetic storm in a decade; it distorted the earth's magnetic field, disrupted long-range communications and low-frequency navigational systems, interfered with ham radio activities, and spread a brilliant auroral display over much of the nation.

Solar flares are divided into three classes depending on the output of X radiation: the common C class, the moderate M class, and the intensive X class. The numerical designation indicates the level of radiation intensity; an X-12, which is the most intense that instruments can measure, is 12 times more intense than an X-1. An X-1 flare releases 10 times more radiation than an M-1, and 100 times more than a C-1.

The increase in the number of sunspots in the current solar cycle, the 21st to be recorded, began in 1976 and peaked in 1979. A decrease in sunspots has been observed since then and is expected to continue until the solar minimum in 1987. It is generally thought that solar flares and magnetic storms evolve from sunspots and that therefore such flares and storms would normally decrease in number after the solar maximum; the reason for the high level of activity that developed in 1982 has not been determined.

Although the increase in activity is unusual for the descending portion of the solar cycle, it substantiates the conclusions reached by Masahisa Sugiura of the Laboratory for Extraterrestrial Physics at the NASA Goddard Space Flight Center. In 1980, he proposed that sunspots and geomagnetic activity do not have a straightforward relationship and concluded that, 'We expect geomagnetic activity to remain high for several years beyond the sunspot maximum epoch.' In addition, he speculated that while the number of storms was likely to decrease, the average intensity of the storms was expected to increase, peaking about 3 years after the sunspot maximum (Eos, October 21, 1980, p. 675). Many geomagnetic storms occur throughout the solar cycle; however, it is the recent concentration of activity, containing a high number of X flares, that concerns scientists, according to Gary Heckman, manager of the Space Environment Services Center of the National Oceanic and Atmospheric Administration. Heckman said that the effects of an intense geomagnetic storm can disorient migratory birds, increase corrosion of gas and oil pipelines, overload powerlines, and expose space vehicles and passengers in polar jet liners to high levels of solar radiation.—*MEG*

Scorecard on Winter Weather Forecast

A comparison of the observed temperatures and precipitation for this past winter (maps on left) with predicted temperatures and precipitation (maps on right) shows that the National Weather Service (NWS) temperature prediction was below par, but that the NWS precipitation forecast was 'quite good,' according to Don L. Gilman, chief of the NWS long-range forecast branch. The predictions, issued November 29, 1982 (Eos, December 14, 1982, p. 1211), covered December, January, and February.

NWS long-range forecasters had thought that frigid Arctic air would sweep far south to bring below-normal temperatures to the western United States. Instead, an east Pacific trough, which may have been the strongest since 1981, brought a strong influx of air from the west, according to Gilman. The intense, low-pressure anomaly in the east Pacific, with the strong westerly winds, teamed with heavy rains south and southwest of Hawaii and warm equatorial Pacific waters to bring warm, wet air to the western United States. The results (see maps):

Throughout most of the country, observed temperatures were above normal (A) or normal (N), while observed precipitation was heavy (H) or normal (no code). Below-normal temperatures (B) occurred only in a portion of the southcentral U.S. and the Florida Keys. Light precipitation (L) fell over two patches in the northern plains, in the Appalachian region, and along the Maine coast.

This past winter, the NWS predictions were made using probability contours, with those predictions with a 60% or greater probability labeled appropriately as above or below normal. (In previous years only two prediction categories had been issued for each forecast, with no regard to probability: above normal and below normal for temperature and heavy and light for precipitation. The areas where neither of these categories fit were labeled 'indeterminate.') NWS analyzed each part of this winter's forecast using the two prediction categories: NWS says it was 56% accurate in its temperature forecast and 69% accurate in its precipitation forecast.—*RTH*

Geophysicists

A supplement to the directory of Fulbright scholars for 1982-1983 lists four visiting scientists who are lecturing and conducting advanced research in geology in universities in the United States. [The March 8 issue of *Eos* lists those U.S. earth scientists who are Fulbright scholars working at universities abroad.]

James W. Cole, a reader in geology at the Victoria University of Wellington in New Zealand, will be comparing New Zealand and U.S. volcanic rocks at the University of California, Santa Cruz. *Tadeusz Cyrul*, a researcher at the Strata Mechanics Research Institute in Poland, recently completed research at West Virginia University in Morgantown in the geomechanics of rocks and rock mass for mine design and will continue his work at the University of Kentucky in Lexington. *Declan G. De Paor*, a lecturer in geology at University College in Galway, Republic of Ireland, is lecturing and researching orthographic analysis of strain and the geological strain in the Appalachian deformation belt at the State University of New York at Albany. *Trevor El-Hott*, a geology lecturer at University College

Forum

Midcontinent Seismicity

I enjoyed reading Arch Johnston's article on the Arkansas earthquake swarm (Eos, December 14, 1982, p. 1209), particularly as it appeared shortly after the fourth recent sizeable earthquake here in South Dakota. Recently we had a fifth earthquake. Using preliminary USGS [U.S. Geological Survey] information, the recent history for southern South Dakota is as follows (magnitude (M) is Richter scale):

Date	Lat.	Long.	M
9/13/81	43.1	101.7	3.4
6/22/82	43.1	102.8	3.0
7/11/82	44.0	96.7	3.6
11/14/82	42.8	97.4	4.3
3/4/83	44.2	99.3	4.4

The last three of these earthquakes were widely felt over parts of southeastern South Dakota and neighboring states and caused slight damage near their epicenters.

Might not this be a candidate for Johnston's list of the most significant recent episodes of seismicity in centraleastern North America? Particularly when keeping in mind that there are no nearby seismographs to record smaller tremors that might be occurring?

In addition the coincidence of the South Dakota episode at the same time as the Arkansas swarm (which continues, according to a recent telephone conversation with Johnston) makes the present time an interesting one for midcontinent seismicity.

This apparent increase in seismic activity in South Dakota might provide an opportunity for study of the seismicity of this part of the continent, were there organizations with available portable seismographs. According to Johnston there is also an opportunity for more investigations of the Arkansas swarm.

David A. Hastings
212 East 31st Street
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in Swansea, Wales, is conducting geology research at the Iowa State University in Ames.

Books

Dynamical Meteorology: An Introductory Selection

B. W. Atkinson (Ed.), Methuen, New York, ix + 228 pp., 1981, $27.50 (hardcover), $12.95 (soft cover).

Reviewed by A. Quinet

This volume contains 15 articles written by 10 different authors. As the preface states, it is aimed to simplify some of the most difficult concepts in physical meteorology so that this science might become understandable to the nonprofessional meteorologist.

After introducing the fundamentals of atmospheric hydrodynamics and thermodynamics—which is presumably the most difficult part to write in view of the goal of the publication—the book discusses worldly and divergence and discusses their uses in several fairly well chosen examples. Next, the problem of the analysis of meteorological fields is dealt with. Here, not only simple methods are presented but also some applications to actual cases. This leads to an approach of the geostrophic balance.

Chapter 9 is essentially an historical review of the development of dynamical meteorology. It is not before this part that the name of Euler is mentioned for the first time. The next two chapters relate to atmospheric turbulence: one on the spectrum of the motions, the other on the methods used to obtain the spectra.

Chapter 12 is devoted to atmospheric energetics. It goes from the simplest idea, the budget of potential plus kinetic energy, up to the difficult concept of available potential energy. The energy cycle, including zonal and eddy components of the energetic quantities, is also fairly well presented and interpreted in terms of air motion. Chapter 13 is a very interesting attempt to rationalize the behaviour of the atmosphere in light of the constraints operating on the flow, which is essentially of the slant-wise convection type.

Finally some information is given regarding the numerical modeling of the atmosphere and the numerical procedures which are used in this important field. A last chapter discusses the application of the fundamental concepts of scale and dimensional analysis to partial differential equations.

It is difficult to make a global assessment of such a collection of articles. Taking into account the fact that this book is addressed to nonspecialists, one can regret several misprints, a notation which is not always uniform, and occasionally the use of equations which are not entirely consistent with those introduced earlier. (For example, eq. (8.14) contains the W-component of the Coriolis term, which is not included in the general equation (8.2).) This is another book that shows how difficult the popularization of knowledge is. On the other hand, there is no doubt that the professional meteorologists will find value in the special effort of presentation which has been undertaken.

A. Quinet is with the Institut Royal Météorologique de Belgique, Brussels, Belgium.

GAP

Social Sciences

7710 Economics

Solar Physics, Astrophysics, and Astronomy

7720 Electromagnetic Radiation

Tectonophysics

5150 Tectonophysics (Plate Tectonics)

Books (cont. from p. 137)

New Publications

Items listed in New Publications can be ordered directly from the publisher; they are not available through AGU.

Advances in Geophysics, vol. 24, B. Saltzman (Eds.), Academic, New York, vii + 328 pp., 1982.

The Arctic Ocean: The Hydrographic Environment and the Fate of Pollutants, L. Rey (Ed.), John Wiley, New York, xii + 433 pp. 1982. $89.95.

Atlas of Igneous Rocks and Their Textures, W. S. MacKenzie, C. H. Donaldson, and C. Guilford, John Wiley, New York, x + 148 pp., 1982, $27.95.

Carbon Dioxide: Friend or Foe? An Inquiry Into the Climatic and Agricultural Consequences of the Rapidly Rising CO₂ Content of Earth's Atmosphere, S. B. Idso, IBR Press, Tempe, Arizona, xiii + 92 pp., 1982.

Chemical Hydrology, W. Back and R. A. Freeze (Eds.), *Benchmark Papers in Geology*, vol. 73, Hutchinson Ross, Stroudsburg, Pa., xv + 416 pp., 1982.

Depositional Systems: A Genetic Approach to Sedimentary Geology, R. A. Davis, Jr., Prentice-Hall, Englewood Cliffs, N.J., xvii + 669 pp., 1983, $83.95.

Environmental Isotopes in the Hydrosphere, V. I. Ferronsky and V. A. Polyakov, translated from Russian by S. V. Ferronsky, John Wiley, New York, viii + 464 pp., 1982, $71.00.

Geological Implications of Impacts of Large Asteroids and Comets on the Earth, L. T. Silver, P. H. Schultz (Eds.), *Spec. Pap. 190*, Geol. Soc. Am., Boulder, Colo., xix + 528 pp., 1982, $40.00.

Geothermal Reservoir Engineering, M. A. Grant, I. G. Donaldson, and P. F. Bixley, Academic, New York, xiii + 369 pp. 1982.

Handbook of Snow: Principles, Processes, Management & Use, D. M. Gray and D. H. Male, Pergamon, New York, ix + 776 pp., 1981.

Introduction à l'Économie Générale de l'Eau, A. Erhard-Cassegrain and J. Margat, Masson, New York, xii + 361 pp., 1983.

Land Surface Processes in Atmospheric General Circulation Models, P. S. Eagleson (Ed.), Cambridge University Press, New York, 1982, $59.50.

Mapa De Recursos Minerales de Antioqua, C. J. Rodríguez C. and A. Pernett M., Ministerio de Minas y Energía, Instituto Nacional de Investigaciones Geologico-Mineras, Bogota, Columbia, 14 pp., 1980.

Measurement of Hydrographic Parameters in Large Sand-Bed Streams From Boats, Task Committee on Hydrographic Investigations of the Committee on Waterways of the Waterway, Coastal, and Ocean Div., Am. Soc. Civ. Eng., New York, v + 81 pp., 1983, $13.50.

Nature and Origin of Cretaceous Carbon-rich Facies, S. O. Schlanger and M. B. Cita (Eds.), Academic, New York, ix + 229 pp., 1982, $39.00.

The Ocean Floor: Bruce Heezen Commemorative Volume, R. A. Scrutton and M. Talwani (Eds.), John Wiley, New York, x + 318 pp. and pocket maps, 1982, $100.00.

Orogeny, A. Miyashiro, K. Aki, and A. M. Celâl Şengör, John Wiley, New York, x + 242 pp., 1982, $45.00.

Petroleum Geology for Geophysicists and Engineers, R. C. Selly, Int. Hum. Resour. Dev. Corp., Boston, vii + 88 pp., 1983, $22.50 cloth, $15.00 paper.

Precambrian Sulphide Deposits: H. S. Robinson Memorial Volume, R. W. Hutchinson, C. D. Spence, and J. M. Franklin (Eds.), *Spec. Pap. 25*, Geol. Assoc. Can., Toronto, Ontario, vii + 792 pp., 1982, $57.00.

Reseña Explicativa Del Mapa Geologico Del Departamento De Nariño, J. L. Arango and A. Ponce, *Informe No. 1818*, Ministerio de Minas y Energía, Instituto Nacional de Investigaciones Geologico-Mineras, Bogota, Columbia, iii + 40 pp., 1980.

Rock-Forming Minerals, vol. 1A, 2nd ed., *Orthosilicates*, W. A. Deer, R. A. Howie, and J. Zussman, Longman, New York, ix + 919 pp., 1982, $149.95.

Sediment Budgets and Routing in Forested Drainage Basins, F. J. Swanson, R. J. Janda, T. Dunne, and D. N. Swanston, *Gen. Tech. Rep. PNW-141*, U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Ore., ii + 165 pp., 1982.

Seismic Reflection Interpretation, A. H. Kleyn, Applied Science, New York, xii + 269 pp., 1983, $57.50.

Space and Planetary Environment Criteria Guidelines for Use in Space Vehicle Development, 1982 rev., vol. 1, R. E. Smith and G. S. West (Eds.), *NASA Tech. Mem. 82478*, NASA, Marshall Space Flight Center, Ala., xii + 220 pp., 1983.

Water Quality, G. S. Tolley, D. Varon, and G. C. Blomquist (Eds.), *Environ. Pol.*, vol. 3, G. S. Tolley (Ed.), Ballinger, Cambridge, Mass., 1983, $36.00.

Classified

POSITIONS AVAILABLE

Assistant Research Oceanographer Position. The Center for Coastal Studies, Scripps Institution of Oceanography, has an opening for a physical oceanographer with a general background in ocean processes with emphasis on field and remote sensing investigations of surface gravity waves.

Faculty Position in Hydrology/College of Forest Resources, University of Washington. The College of Forest Resources of the University of Washington invites applications for a tenure track position in the area of forest hydrology.

Assistant Professor/University of Alberta. The Department of Physics at the University of Alberta invites applications for a tenure track position at the level of an Assistant Professor in Physics in any of the following areas:

1. Astrophysics and Astronomy;
2. Geophysics (Electromagnetic methods);
3. Theoretical Physics (Medium Energy, Particle Physics, Relativity and Cosmology).

Statistician (Scientist II)/National Center for Atmospheric Research. To work as a scientist/statistician in a multidisciplinary group combining studies of environmental and physical impact of atmospheric processes and carry out independent research program in statistical meteorology and related areas.

Postdoctoral Research Assistantships/UCLA. The Space Physics Group at UCLA invites applications for a postdoctoral research position which will become available in October 1983.

Geology. Instructor to teach geology, geography, and physical science in public community college. Desire Master's degree in geology or related field with minor in chemistry, mathematics, or computer science. Prior teaching experience in college level. Start August 1983. Salary range $15,000 to $19,000 for academic year. Apply by May 2, 1983, to President, North Idaho College, Coeur d'Alene, Idaho 83814.

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How EOS's weekly frequency can increase the impact of Advertising

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EOS

Cover. Photomicrograph of a heavily etched surface of experimentally deformed, polycrystalline rock salt. Plane polarized light; scale line is 0.3 mm. Cubic faces {100} have different orientations in each of the crystals and provide a way to map (with the Universal-stage) the crystallographic orientations of the crystals in the aggregate. Since halite is isotropic to light, normal optical means cannot be used to orient the crystal axes. Instead, previous methods have involved artificially cleaving the crystals (which introduces damage) or using internal, 'cubic' fluid inclusions to map the grain orientation. The etching technique can be used when cleaving is undesirable or impractical or when the inclusions are not available. Further details may be obtained from Mel Friedman, Texas A&M University, College of Geosciences, College Station, TX 77843. (Photo courtesy of Mel Friedman.)

Meetings

Announcements

Magnetosphere Studies

A preliminary call for papers has been issued for the Symposium on the Achievements of the International Magnetospheric Study (IMS), to be held in conjunction with the 25th Meeting of the Committee on Space Research (COSPAR) at the Kongresszentrum in Graz, Austria, June 25–27, 1984. The symposium will examine IMS contributions to the understanding of the earth's plasma environment.

Sessions at the symposium will include structure and dynamics of magnetospheric boundaries; particle sources, transport, storage and precipitation; wave phenomena; and magnetosphere–ionosphere coupling. Review and poster sessions also are offered.

Deadline for receipt of abstracts of contributed papers is November 30, 1983. Papers presented at the symposium, organized by the Scientific Committee on Solar–Terrestrial Physics of the International Council of Scientific Unions, will be published in a volume of proceedings. For further information contact J. G. Roederer, Geophysical Institute, University of Alaska, Fairbanks, AK 99701.

Water Resources

A conference on the implications and possible consequences of the planned diversions of the Missouri River will be held May 24, 1983, at the University of Missouri in Kansas City. The first half of the program for 'Water Resources Planning for the Missouri River Basin' will present facts of the regional studies to reallocate Missouri River water; the second half will explore the political implications of the proposed diversions.

Topics to be discussed include energy, agricultural, and economic implications of diversions; the role of the Missouri Basin States Association in water allocation and diversions; the positions of the various states affected by the proposals to divert; and the legal rights; navigational consequences; and effects on conservation and recreation of proposed diversions.

The conference is sponsored by the College of Engineering and Engineering Extension of the University of Missouri-Columbia; the University of Missouri Water Resources Research Center; the University of Missouri-Rolla Institute for River Studies; the Iowa State University Water Resources Research Institute; the Midwest Research Institute; the Missouri River Shippers and Operators Committee of the Missouri River Basin Association; and the U.S. Corps of Engineers, Kansas City district.

For additional information, contact Virginia Nettleton at the University of Missouri-Columbia (telephone: 314-882-2087).

GOES Satellites

'Exploiting METSAT Data for Public and Private Benefits' is the theme of a 2-day workshop to be held April 28–29 in Orlando, Fla., that will discuss the use of meteorological satellite data supplied by the geostationary operational environmental satellite (GOES). GOES satellites, positioned above the equator, make repetitive observations of the earth and of the atmosphere. Data is transmitted to ground stations and relayed to a variety of users.

Workshop topics will include cover systems designs; economic and social advantages; routine and instrumentional applications; science contributions; and possibilities for the future.

The National Oceanic and Atmospheric Administration (NOAA) and the Hughes Aircraft Company will cosponsor the workshop. Those attending the workshop are invited to observe the launch of the GOES-F satellite at Cape Canaveral, Fla., also scheduled for that week.

For additional information, contact David D. Canner, Worldway Postal Center, P.O. Box 91798, Los Angeles, CA 90009 (telephone: 213-648-3582).

Geophysical Year

New Listings

The complete Geophysical Year List appeared in the December 21, 1982, *Eos*. A boldface meeting title indicates sponsorship or cosponsorship by AGU.

April 24–27, 1983 Annual Conference of the National Association of Environmental Professionals, Detroit, Mich. (NAEP, P.O. Box 9400, Washington, D. C. 20016, telephone: 301-229-7171; or Terry Yonker, NAEP, 13600 Grace Drive, Eagle, MI 48822,telephone: 517-626-6260).

Section Meetings of the Geological Society of America (Joan Latulippe, Meetings Department, Geological Society of America, Boulder, CO 80301; telephone: 303-447-2020):

April 28–29, 1983 North-Central Section, Madison, Wis.; **May 2–4, 1983** Joint Rocky Mountain Section and Cordilleran Sections, Salt Lake City, Utah; **April 4–6, 1984** Joint North-Central Section and Southeast Sections, Lexington, Ky.; **March 26–27, 1984** South-Central Section, Dallas, Tex.

1983 AGU
SPRING MEETING
May 30–June 3

The 1983 Spring Meeting of the American Geophysical Union will be held in Baltimore from Monday, May 30, to Friday, June 3, at the Baltimore Convention Center. The convention center is linked by an elevated pedestrian walkway to Harbor Place, a development of colorful and unique boutiques and restaurants overlooking Baltimore harbor.

Baltimore has experienced a dramatic rebirth in the last decade. The sparkling Inner Harbor has come to life with the opening of the twin crystalline pavilions of Harborplace, the unusual 423-foot high World Trade Center, the tallest pentagonal structure in the world, and the National Aquarium with its 932,900 gallon tank capacity. In addition, the Inner Harbor of Baltimore is a myriad facility of aquatic recreation and history.

The exotic and elaborate variety that encompasses 'Charm City' is evident in every phase of life: from its ethnic and reconstructed cobblestone and brick townhouse neighborhoods, to its vast array of dining establishments, Baltimore is an exceptionally delightful experience worth savoring.

Shop Baltimore's world famous markets which date back to the late 1700s. Tour the city's cultural and historic attractions, the restored mansions, churches, parks, Fort McHenry, the U.S. Frigate Constellation and the Maryland Science Center. You will be pleasantly surprised at all Baltimore has to offer.
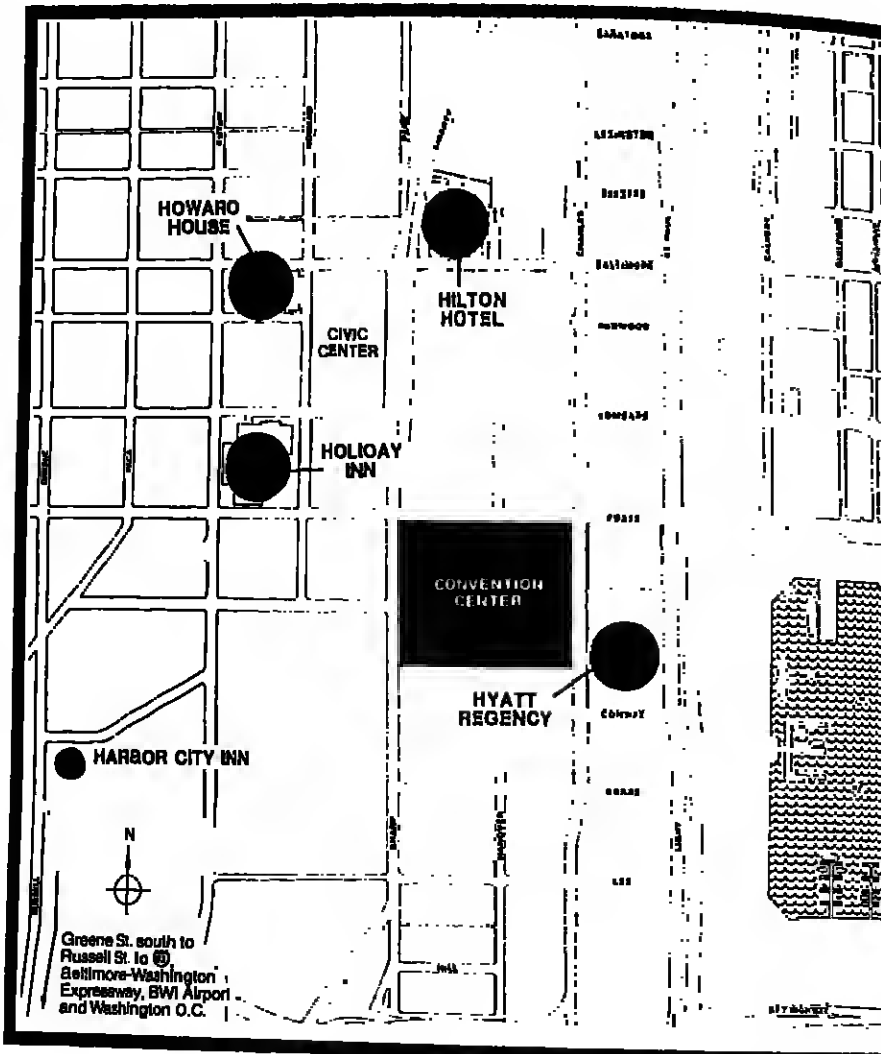
Hotel Accommodations. Blocks of rooms are being held at the Hilton, the Hyatt Regency, the Holiday Inn, the Howard House, and the Harbor City Inn for those attending. Read the housing application and mail the completed application form to the housing bureau early to ensure reservations at your preferred hotel.

Transportation. For the visitor arriving at Baltimore-Washington International Airport (BWI), it is only an 8-mile (13-km) ride to downtown Baltimore. Be sure to read the special announcement about discounted airfare, which also applies to flights to and from Washington airports.

Registration. Everyone who attends the meeting must register. Preregistration (received by May 11) saves you time and money, and the fee will be refunded if ACU receives written notice of inability to attend by May 26. Registration for 1 day only is available at one half of the applicable preregistration rates, either in advance or at the meeting. Registration rates are as follows:

	Pre-registration	After 5/11
Member	$65	$80
Student member	$32	$47
Nonmember	$85	$100
Student nonmember	$39	$54
Retired senior member	$32	$49

Members of the American Meteorological Society, the American Society of Photogrammetry, Union Geofisica Mexicana, the Canadian Geophysical Union, the European Geophysical Union, and the American Congress on Surveying and Mapping may register at the AGU member rates.

The difference between member (or student member) registration and nonmember registration may be applied to AGU dues if a completed membership application is received at AGU by July 25, 1983. Current ACU annual membership rates are $24 for members and $7 for student members.

To preregister, fill out the registration form, and return it with your payment to AGU before May 11. Your receipt will be included with your preregistration material at the meeting. Preregistrants should pick up their registration material at the preregistration desk at the Convention Center. Monday through Friday registration hours are 8 A.M. to 4 P.M. On Sunday, May 29, registration hours are 3:30–7:30 P.M. in the lobby of the Hilton Hotel. Complimentary badges for guests not attending the scientific sessions will be available at the registration desk.

Scientific Sessions. The preliminary program with abstracts will be published in Eos, May 3. All scientific sessions will be held at the convention center. See the section below headed 'Program Summary.'

Poster Sessions. Poster sessions will be held throughout the meeting in Exhibit Hall A. These sessions will include papers from almost all sessions of the Union. The normal hours for poster presentations are from 9:00 A.M. to 12:00 noon and from 2:00 P.M. to 5:00 P.M. However, posters for the morning session may be left for viewing until 1:00 P.M.

For poster sessions, ACU will provide each presenter with a mounting area measuring 4 x 6 feet (1.25 x 2.50 m). The board will be assigned by numbers corresponding to the presenters abstract number. Plan your exhibit to fit this space. The boards will be set up in the designated rooms before the poster session begins. Thumb tacks, push pins, tape, and scissors will be available in the meeting room.

Social Events. An Ice Breaker on Monday evening at the convention center is the opening social event of the meeting.

Complimentary refreshments will be served daily in Exhibit Hall A. Coffee breaks are 9:30–10:30 A.M. and beer breaks 2:45–3:45 P.M.

Awards Ceremony and Reception. The Awards Ceremony will be held in the Francis Scott Key Ballroom of the Hilton Hotel at 6:00 P.M. on Wednesday, June 1. All meeting participants are invited and are urged to attend. A Reception will follow the ceremony; you can meet and congratulate those being honored and share a glass of wine with them.

President's Dinner. The President's Dinner in honor of the medalists, awardees, and fellows will begin at 8:00 P.M. at the Hilton. It will be a more lavish and formal affair; black tie is optional. Tickets for the dinner are $25 per person. Purchase your tickets with your preregistration.

Exhibits. The exhibit area in Exhibit Hall A will open 9 A.M. Tuesday and will remain open through Thursday between 9 A.M. and 4 P.M.

Exhibitors confirmed to date are:
Academic Press Inc.
ACU Book/Periodical Show
American Geophysical Union
Defense Mapping Agency/HTC
D. Reidel Publishing Company
Elsevier Science Publishing Company, Inc.
ENDECO, Inc.
General Electric
Kinemetrics, Inc.
National Science Foundation
NASA/GSFC
Phoenix Geophysics Ltd.
Sapphire Instruments
Schonstedt Instrument Co.
Teledyne Geotech
Terra Technology
USGS

Business Meetings and Section Luncheons. The ACU Council will meet Tuesday, May 31, at 5:30 P.M. in the Constellation Ballroom E&F, Hyatt Regency. The annual business meeting of the Union will follow the Council meeting. Members are welcome.

The Hydrology Section Executive Committee will meet Thursday, June 2, at 4:30 P.M. in the Preston Room, Hilton Hotel.

The Solar-Planetary Relationships Section business meeting will be on Thursday following an afternoon technical session in Room 310. Refreshments will be served.

Section luncheons will be held in the Hyatt Regency. Rooms will be published in the at-meeting program. Please indicate on the registration form which luncheon you plan to attend and include payment. Cost is $9.50 per ticket (except for the Seismology luncheon).

The Oceanography luncheon will be held on Tuesday. Bruce Robison, University of California at Santa Barbara, will speak on the 'Status of the UNOLS Research Fleet.'

The luncheons of the Geomagnetism and Paleomagnetism, Hydrology, and Planetology/Volcanology, Geochemistry, and Petrology sections will be held on Wednesday.

The Seismology luncheon, sponsored by Kinemetrics, Inc., Teledyne Industries, Inc., and W. F. Sprengnether Instrument Co., Inc., will also be on Wednesday; cost is $5.00 per ticket. Brian J. Mitchell, St. Louis University, will speak on 'The Early History of Seismology in the Central United States.'

The Atmospheric Sciences, Geodesy, and Tectonophysics luncheons will be on Thursday.

Program Summary

Union
Satellites & Geosciences, Wed AM
History of Geophysics, Wed AM
Satellites & Geosciences, Wed PM
Test Ban Verification, Thurs AM
Test Ban Verification, Thurs PM

Atmospheric Sciences
Tropospheric Chemistry, Mon PM
El Chichón, Tues AM
Dry Deposition, Tues AM
Stratospheric Chemistry, Tues PM
Ocean/Climate Interactions, Wed PM
New Observing Systems, Thurs AM
Climate Changes, Thurs AM
History of Meteorology, Thurs PM

Geodesy
Earth & Ocean Tides, Tues AM
Results on Earth Rotation, Tues PM
Gravity Analysis I, Wed AM
Crustal Movements I, Thurs AM
Crustal Movements II, Thurs PM
Gravity Analysis II, Fri AM

Geomagnetism & Paleomagnetism
Magnet Studies, Mon AM
Long Wavelength Anomalies, Mon PM
Paleomagnetism—Sediments, Tues AM
Paleomagnetic Results, Tues PM
Reversals & Plate Motion, Wed AM

Hydrology
General Surface Water, Mon AM
Intl. Urban Hydrology I, Mon PM
Urban Runoff I, Tues AM
Intl. Urban Hydrology II, Tues PM
General Hydrology, Wed AM
Urban Runoff II, Wed PM
General Ground Water, Thurs AM
Ground Water & Fractures I, Thurs AM
Ground Water & Fractures II, Thurs PM
Evapotranspiration, Fri AM

Oceanography
Absolute SST Measurements, Mon AM
Texas/Louisiana Shelf, Mon AM

Ahoy! Sail Back into Baltimore
for the 1983 AGU Spring Meeting
May 30–June 3

HOTEL ACCOMMODATIONS

PARTICIPATING HOTELS	HOTEL CODE	ROOM RATES
Hyatt Regency 300 Light Street (301) 528-1234	HRDT	Single: $56.00 Double: $66.00 Twin: $66.00 Extra person: $15.00
Baltimore Hilton 101 W. Fayette Street (301) 752-1100	BHDT	Single: $51.00 Double: $61.00 Twin: $61.00 Extra person: $10.00 Parlor + 1 $150.00 to $190.00 Parlor + 2 $200.00 to $250.00
Holiday Inn – Downtown 301 W. Lombard Street (301) 685-3500	HIDT	Single: $39.00 Double: $47.00 Twin: $55.00 Extra person: $10.00
Howard House Hotel 8 North Howard Street (301) 539-1680	HHDT	Single: $33.00 Double: $38.00 Twin: $42.00 Parlor + 1 $52.00 Extra person: $10.00
Harbor City Inn 1701 Russell Street (301) 727-3400	HCI6	Single: $32.00 Double: $37.00 Twin: $37.00 Extra person: $6.00

PARKING: Hyatt/$6.00 Hilton/$2.60 Holiday Inn/free Harbor City Inn/free - (location requires car or bus transportation to Convention Center)

* Subject to change.

All hotel reservations must be made on the housing form by April 25, 1983. No telephone requests will be accepted. Confirmations will be mailed directly to registrants by the individual hotels. After confirmation has been received, changes and cancellations should be made with the hotel directly.

Mail your completed form directly to:

Housing Coordinator
AGU Spring Meeting
Baltimore Housing Bureau
1 East Pratt Street
Baltimore, Maryland 21202

PLEASE RETAIN THIS FORM FOR YOUR RECORDS

American Geophysical Union
SPRING 1983 MEETING
May 30 – June 3, 1983
Baltimore, Maryland

HOUSING APPLICATION FORM

Housing Coordinator
AGU Spring Meeting
Baltimore Housing Bureau
1 East Pratt Street
Baltimore, Maryland 21202

READ CAREFULLY:
Please print or type (pice spaced) all information abbreviating as necessary. Confirmation will be sent by the hotel to the individual named in Part I. If more than one room is required, this form may be photocopied.

PART I
REQUESTOR
LAST NAME / FIRST
NAME OF COMPANY OR FIRM
STREET ADDRESS OR P.O. BOX NUMBER
CITY / STATE / ZIP-U.S.A.
COUNTRY / AREA CODE / PHONE NUMBER

PART II
INSTRUCTIONS: Select THREE Hotel/Motels of your choice from the list of participating facilities, than enter the appropriate code letters in the boxes below.

FIRST CHOICE (HOTEL CODE)
SECOND CHOICE (HOTEL CODE)
THIRD CHOICE (HOTEL CODE)

NOTE: Rooms are assigned in "First Come First Serve" order and if none of your choices are available, another facility will be assigned based on a referral system arranged by your convention organizer. A cut-off date is in effect and your application may not be processed if received after 14 days prior to your arrival date.

* AGU housing registration deadline is April 25.

PART III
INSTRUCTIONS:
1. Select type room desired with arrival and departure dates.
2. PRINT or TYPE names of ALL persons occupying room.
3. If more than two people share a room, check twin and the hotel will assign two double beds.

CHECK ONE
☐ SINGLE (Room with one bed one person)
☐ DOUBLE (Room with one bed two persons)
☐ TWIN (Room with two beds two persons)
☐ P.+1 (Parlor plus one-bedroom suite)
☐ P.+2 (Parlor plus two-bedroom suite)
☐ EXTRA PERSON

Arrival Date: MO. DAY
Departure Date: MO. DAY
Arrival Time: AM / PM

Guest Names (Print Last Name First)
1.
2.
3.

IMPORTANT NOTE: Hotel MAY require a deposit or some other form of guaranteed arrival. If so, instructions will be on your confirmation form.

RETURN THIS FORM WITH PAYMENT TO:
Meetings Registration
American Geophysical Union
2000 Florida Ave., N.W.
Washington, D.C. 20009

PLEASE PRINT CLEARLY

NAME ON BADGE

AFFILIATION

MAILING ADDRESS

Telephone #
HOTEL

Days you plan to attend.
☐ Monday ☐ Wednesday ☐ Friday
☐ Tuesday ☐ Thursday
Please check appropriate box.

Members of the cooperating societies may register at AGU member rates.
Member badges are blue on white.
Nonmember badges are red on white.
☐ Member AGU ☐ Nonmember
☐ Member cooperating society.
AMS-American Meteorological Society
ASP-American Society of Photogrammetry
ACSM-American Congress on Surveying and Mapping
UGM-Union Geofisica Mexicana
CGU - Canadian Geophysical Union
EGS - European Geophysical Union

Nonmembers
The difference between member (or student member) registration and nonmember registration may be applied to AGU dues if a completed membership application is received at AGU by July 25, 1983. Current AGU annual membership rates are $24 Members; $7 Student Members.

Preregistrants
Your receipt will be in your preregistration packet. The registration fee will be refunded if written notice of inability to attend is received in the AGU office by May 26. The program and meeting abstracts will appear in the May 3 issue of EOS, which is mailed to all members of AGU in advance of the meeting.

Office Use Reference Number

AGU 1983 SPRING MEETING
MAY 30–JUNE 3, 1983
Baltimore, MD.

REGISTRATION FORM
DEADLINE FOR RECEIPT OF PREREGISTRATION
MAY 11, 1983

(rates applicable only if received by May 11, with payment)

	More than one day	One day
MEMBER	☐ $65	☐ $32.50
STUDENT MEMBER	☐ $32	☐ $16
NONMEMBER	☐ $85	☐ $42.50
STUDENT NONMEMBER	☐ $39	☐ $19.50
RETIRED SENIOR MEMBER	☐ $32	☐ $16
ABSTRACTS (May 3, 1983, EOS)	☐ $5	☐ $5
PRESIDENT'S DINNER -Wednesday	☐ $25	☐ $25

SECTION LUNCHEONS
All tickets are $9.50 except for Seismology which is sponsored, cost is $5
☐ Atmospheric Sciences-Thursday
☐ Geodesy-Thursday
☐ Geomagnetism and Paleomagnetism-Wednesday
☐ Hydrology-Wednesday
☐ Oceanography-Tuesday
☐ Planetology/Volcanology, Geochemistry and Petrology-Wednesday
☐ Seismology-Wednesday
☐ Tectonophysics-Thursday

Charge to: ☐ American Express ☐ Visa ☐ Master Card

Card Number
Expiration Date
Signature
Other payments (Please identify) $
Total enclosed $

(All orders must be accompanied by payment or credit card information. Make check payable to AGU.)

Office Use
Code
Check No.

Airfare Information
Special 30% Discounted Air Fares Available When You Fly UNITED or DELTA to Baltimore.

UNITED Your toll-free number for flight reservations: 800-521-0810 (Michigan residents 800-482-0243)
Your AGU Convention Number 6318

Special arrangements have been made with United Airlines to offer you a special discount off regular roundtrip coach . . . available only when you call the unlisted toll-free number of United's Convention Desk: 8:30 A.M.–8:30 P.M. EST Monday through Friday.

Just call the above number, available to those within the 48 contiguous states. Ask for the Convention Desk. Tell them you are attending the AGU convention in Baltimore, or give them your AGU Convention Number: 6318.

Here are the details on your special AGU convention fare:
• 30% lower than the normal roundtrip coach fare in effect at the time of your ticket purchase
• No minimum stay is required
• Travel may commence no earlier than May 23, 1983, and must be completed on or before June 10, 1983
• Reservations should be made as early as possible. The final date for reservations and ticketing is May 17, 1983.
• Ticket purchase may be made directly from United, who will mail your tickets directly to you. Just identify your method of payment when you call. If you wish to do so, you may purchase your ticket through an authorized travel agency. However, YOU, not your travel agent, should call United's unlisted number.

Special Note in the current competitive 'air fare war' there are 'superseve' fares and other short-lived and sporadic discounted fares from specific cities to Baltimore. These fares have restrictions and are limited. United's convention specialists will assist you in determining if your travel plans meet these specific restrictions and will assist you in making reservations at the best available rate.

Members in Hawaii: Call your local United reservations office for assistance. Identify yourself as attendees of the AGU meeting in Baltimore and ask your reservation agent to queue your record to Detroit 56.

DELTA Call Delta Toll Free 1-800-241-6760 Continental U.S. (1-800-282-8536 Georgia Only)

Delta Air Lines, in cooperation with the American Geophysical Union, is offering a special convention rate, the YE253, which affords a savings of at least 30% for attendees traveling on Delta to their meeting. Departures to Baltimore must be from your home city between May 26 and June 1, 1983. Reservations must be confirmed and tickets purchased seven (7) days prior to your departure round trip via Delta. If special fares which represent a savings greater than our convention rate, YE253, are available to Baltimore, Delta will attempt to confirm your reservations at that rate. For reservations and information call Delta . . . TOLL FREE . . . or your Travel Agent.

Meetings (cont. from p.141)

SAR & Visible Imagery, Mon PM
Gulf of Maine, Mon PM
Atlantic Variability, Tues AM
STACS, Tues PM
Marine Geology I, Wed AM
Marine Chemistry, Wed PM
Marine Geology II, Wed PM
Tides & Waves, Wed PM
Paleo-oceanography, Thurs AM
Estuarine Geochemistry, Thurs AM
Physical Oceanography, Thurs PM
Trace Elements, Thurs PM
Chemical Fluxes, Fri AM
Ocean Currents, Fri AM

Planetology
Moon & Mars Meteorites I, Mon AM
Moon & Mars Meteorites II, Mon PM
Planetary Exospheres, Tues AM
Surfaces & Geophysics, Tues PM
Planetary Posters, Tues PM

Seismology
Prediction, Mon AM
Crust & Rays, Mon AM
Modes & Surface Waves, Mon PM
Sources & Stress, Tues AM
Ocean Margins, Tues PM
Seismology & Volcanism, Wed AM
Global & Regional Seismicity, Wed PM
Q & Fluid Interaction, Thurs PM
Ocean Surveys & Seismicity, Fri AM

SPR: Aeronomy
Exosphere/Ionosphere, Mon AM
Airglow/Aurora, Mon PM
Thermospheric Dynamics I, Tues AM
Thermospheric Dynamics II, Tues PM
Ionosphere/Airglow, Tues PM
Atmospheric Electricity I, Wed AM
Atmospheric Electricity II, Wed PM
Radar Studies Ionosphere I, Thurs AM
Radar Studies Ionosphere II, Thurs PM
Middle Atmosphere I, Thurs PM
Middle Atmosphere II, Fri AM

SPR: Cosmic Rays
Cosmic Rays in Geophysics, Mon AM
Cosmic Rays in Geophysics, Mon PM
Flares & Cosmic Rays, Tues PM

SPR: Magnetospheric Physics
CDAW-6 Results I, Tues AM
Charged Particles I, Tues PM
Waves & Instabilities, Tues PM

Tail & Boundary Layer I, Tues PM
Jupiter & Saturn, Tues PM
Numerical Simulation I, Tues PM
CDAW-6 Results II, Tues PM
Aurora & Substorms I, Tues PM
Currents & Fields, Tues PM
Tail & Boundary Layer II, Wed AM
Frontiers of SPR, Wed PM
Numerical Simulation II, Wed AM
Charged Particles II, Thurs AM
Waves, Currents, E Fields, Thurs AM
Numerical Simulation III, Thurs PM
Aurora & Substorm II, Thurs PM
Lab & Space Experiments, Fri AM
Aurora & Substorms III, Fri AM

SPR: Solar & Interplanetary Physics
Solar Seismology, Mon AM
Corona & Solar Wind, Tues AM
Sunspots & Solar Data, Tues PM
Shocks I, Wed AM
Shocks II, Wed PM
MHD Turbulence in Space, Thurs PM

Tectonophysics
Ridges & Convection, Mon PM
Subduction, Tues AM
Crustal Deformation, Tues AM
Mineral Physics, Tues PM
Ocean Crust, Tues PM
Cracks & Brittle Behavior of Rock, Wed AM
Structural Geology, Wed PM
Continental Crust, Thurs PM
Paleo-oceanography, Thurs AM
Basins & Seismic Reflection, Thurs PM
Ductile Rock Deformation, Thurs PM
Q & Fluid Interaction, Thurs PM
Mantle Heterogeneities, Fri AM

Volcanology, Geochemistry, & Petrology
Antean Magmatism I, Mon AM
Ophiolites & Anorthosites, Mon AM
Andean Magmatism II, Mon PM
Precambrian, Mon PM
Oceanic Basalt, Tues AM
Volcanic Petrology, Tues PM
Isotope Geochemistry I, Tues AM
Xenoliths, Kimberlites, Wed AM
Water in Silicate Melt I, Wed AM
Water in Silicate Melt II (Posters), Wed PM
VGP Posters, Wed PM
Mantle Heterogeneities I, Thurs AM
Experimental Petrology I, Thurs AM
Experimental Petrology II, Thurs PM
Mantle Heterogeneities II, Thurs PM
Metamorphic Petrology, Fri AM
Mineralogy & Crystallography, Fri AM

AGU

Membership Applications Received

Applications for membership have been received from the following individuals. The letter after the name denotes the proposed primary section affiliation; the letter A denotes the Atmospheric Sciences section, which was formerly the Meteorology section.

Regular Member

Arthur B. Baggeroer (S), Arthur L. Besse (SS), Pat Bluckwelder (O), R. Allyn Clarke (O), Roger A. Clay (H), Peter J. Carey (I), David A. Farrell (H), John W. Fowler (H), Dulal C. Goswami (H), Frank R. Harris (SA), Caroline M. Isacs (V), Gregory N. Ivey (O), Charles Jacoby (O), Lee H. Jefferis (I), Joseph P. Kahan (G), Mark W. Killgore (H), Randall L. Mowry (H), William R. Ott (S), David C. Ruble (T), James G. Shive (H), Martin E. Spongberg (T), Marshall R. Taylor (H), David B. White (T).

Student Member

Frank Adams (SS), Francis Alvarez (T), Derick Balsiger, Andrew Bankinkiewirz (H), Maurice Bloomutine (O), Michel Daily (V), Michael D. Brehm (H), Charles B. Curtino (V), Roman E. Glazman (O), Charles M. Gadman (T), Melinda M. Hall (O), Patricia A. Julien (H), Richard F. Kantenberger (S), David A. Kline (T), Michael R. Nelson (T), Anthony D. Owens (V), Jan Svejkovsky (O).

Associate Member

Noel E. Bonnann (H), Paul W. Clark (S).

GAP

Geochemistry

Geomagnetism and Paleomagnetism

Hydrology

Meteorology

3705 Air Quality

Oceanography